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Transformation of 2,4,6-Trinitrotoluene into toxic hydroxylamino derivatives by lactobacilli

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Abstract

Lactobacilli isolated from different ecological niches were capable of partial nitroreduction of 2,4,6-trinitrqtoluene (TNT) to hydroxylaminodinitrotoluenes (HADNT) at a high rate (up to 93 nmol/(min mg dry biomass). For the most active (with respect to the reaction rate) strains, Lactobaculus fermentum BS3601 andLacîobacillusplantarum BS3604, the extent of transformation comprised 95-97%. An inverse correlation was found between the ability to transform TNT and resistance of bacteria to its toxic action. The inhibitory effects of TNT and HADNT on the activities of glucose-6-phosphate dehydrogenase (G-6-PDH) and glyceraldehydë-3-phosphate dehydrogenase (PGADH) in cell extracts of lactobacilli were revealed.

Keywords

2,4,6-trinitrotoluene, Biotransformation, Lactobacilli, Toxicity